U. S. Naval Aerospace Medical Institute

PROGRESS REPORT NO. 15

NASA ORDER NO. R-93

THE PROBLEM OF MAN'S GRAVITOINERTIAL FORCE ENVIRONMENT IN SPACE FLIGHT

Submitted to NASA, Biotechnology and Human Research Division, Office of Advanced Research and Technology, Washington, D. C.

By

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Period Covered

1 October 1966 - 31 December 1966

The area of interest comprised in the term "motion sickness" provides, today, an exciting and profitable field for the investigator. This is true whether his special interest is in etiology, symptomatology, phenomena associated with or revealed by the symptomatology, or therapy. Although our knowledge of this disorder can be traced back to some of the earliest historical documents, yet, until recently, the literature dealing with motion sickness had little scientific merit except for certain descriptive reports. Our interest in this field was aroused by the symptoms manifested by persons exposed in the Pensacola Slow Rotation Room and the possibility of conducting studies under laboratory conditions. Our findings have touched at least on nearly every major aspect of motion sickness.

In the accompanying Figure prepared by Professor Wood is shown a ranking of exemplary antimotion sickness drugs as determined by their effectiveness in altering susceptibility to symptoms in the SRR. Both the fact that individual variance in effectiveness was demonstrated and the fact that drugs tended to group in terms of their pharmacological action are proofs that the test procedure was reliable and had validity. Before mentioning the ways in which this information can be used, it is worth digressing a moment to point out the crucial factors necessary to ensure reliability of the test procedure: 1) flexibility and control of the force environment, 2) experimenter-paced exposure to stress, 3) categorization of different levels of motion sickness to provide a reliable end-point, "severe malaise" (M III), short of a degree of "sickness" unacceptable to subjects and also conditioning future

responses, and 4) careful evaluation of subjects, including functional tests of the semicircular canals and otolith organs.

The information obtained is useful first in demonstrating the effectiveness of antimotion sickness drugs in a spacific type of force environment, and, second, these findings are readily available as a criterion reference for comparison with analogous findings in other force environments.

Arrangements have been completed for holding the Third Symposium on The Role of the Vestibular Organs in Space Exploration in Pensacola January 24-26, 1967.

Facilities: No major changes.

Personnel: Manning J. Correia, LT, MSC, USNR, who made major contributions to our studies during his 3-year tour of duty in Pensacola, was released on 1 November 1966 and is now associated with the Defence Medical Research Laboratories, Toronto, Canada. His work on otolith shear and the visual perception of force direction and his contribution to a comprehensive kinematics nomenclature for vestibular studies deserve special mention.

Completed Reports

123.* Hixson, W. C., and Anderson, J. J., The Coriolis Acceleration Platform: A unique vestibular research device.

124. Wood, C. D., and Graybiel, A., Evaluation of additional antimotion sickness drugs in the Slow Rotation Room. Study IV.

125. Fregly, A. R., and Graybiel, A., Age-sex differences using a new battery of postural equilibrium (ataxia) tests performed on the floor.

126. Thompson, A. B., Graybiel, A., and Cramer, D. B., Determining the effectiveness of fractional g levels in reducing circulatory deconditioning of space flight crews: A new technique and preliminary results.

127. Clark, B., and Graybiel, A., The egocentric localization of the visual horizontal in normal and labyrinthine defective observers as a function of head and body tilt.

Serial numbers.

EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS IN PREVENTING CANAL SICKNESS IN 50 SUBJECTS EXPOSED ON 500 OCCASIONS IN A ROTATING ENVIRONMENT USING THE DIAL TEST. ③